

CLAIMS

What is claimed is:

1. An optical multiplexing device comprising:
a light bandpass filter that passes a first light wavelength at a first angle of incidence and passes a second light wavelength at a second angle of incidence;
a light source that directs a first incident beam including light of the first wavelength and light of the second wavelength at the first angle of incidence onto the light bandpass filter, the light bandpass filter passing the light of the first wavelength therethrough and reflecting a first reflected beam therefrom; and
a first light receptor and redirector that receives the first reflected beam, and redirects the first reflected beam back onto the light bandpass filter at the second angle of incidence as a second incident beam, the light bandpass filter passing the light of the second wavelength therethrough and reflecting a second reflected beam therefrom.
2. The optical multiplexing device of claim 1, further including
a first light receiver positioned to receive the light of the first wavelength after it passes through the light bandpass filter, and
a second light receiver positioned to receive the light of the second wavelength after it passes through the light bandpass filter.
3. The optical multiplexing device of claim 1, wherein
the light bandpass filter passes a third light wavelength at a third angle of incidence,
the incident beam includes light of the third wavelength, and
the optical multiplexing device further includes
a second light receptor and redirector that receives the second reflected beam and redirects the second reflected beam back onto the light bandpass filter at the third angle of incidence as a third incident beam, the light bandpass filter passing the light of the third wavelength therethrough and

10 reflecting a third reflected beam therefrom.

4. The optical multiplexing device of claim 3, wherein the first incident beam, the second incident beam, and the third incident beam are coplanar.

5. The optical multiplexing device of claim 3, wherein the first incident beam, the second incident beam, and the third incident beam are not coplanar.

6. The optical multiplexing device of claim 1, wherein the first light receptor and redirector comprises

a receiving collimator positioned to receive the first reflected beam,
a redirecting collimator positioned to transmit the second incident beam,

5 and

an optical link from the receiving collimator to the redirecting collimator.

7. The optical multiplexing device of claim 6, wherein the optical link comprises a mirror.

8. The optical multiplexing device of claim 6, wherein the optical link comprises an optical fiber.

9. An optical multiplexing device comprising:

a light bandpass filter comprising a substrate and a multilayer dielectric light-transmissive optical stack deposited upon the substrate;

5 a light source that directs an incident beam including light of a first wavelength and light of a second wavelength onto the light bandpass filter at a first angle of incidence, the light bandpass filter passing the light of the first wavelength therethrough and reflecting a first reflected beam therefrom; and

a light receptor and redirector that receives the reflected beam and redirects the first reflected beam back onto the light bandpass filter at a second angle of

- 10 incidence, the light bandpass filter passing the light of the second wavelength therethrough and reflecting a second reflected beam therefrom.

10. The optical multiplexing device of claim 9, further including
a first light receiver positioned to receive the light of the first wavelength
after it passes through the light bandpass filter, and
a second light receiver positioned to receive the light of the second
5 wavelength after it passes through the light bandpass filter.

11. The optical multiplexing device of claim 9, wherein
the light bandpass filter passes a third light wavelength at a third angle of
incidence,
the incident beam includes light of the third wavelength, and
5 the optical multiplexing device further includes
a second light receptor and redirector that receives the second
reflected beam and redirects the second reflected beam back onto the light
bandpass filter at the third angle of incidence as a third incident beam, the light
bandpass filter passing the light of the third wavelength therethrough and
10 reflecting a third reflected beam therefrom.

12. The optical multiplexing device of claim 11, wherein the first
incident beam, the second incident beam, and the third incident beam are
coplanar.

13. The optical multiplexing device of claim 11, wherein the first
incident beam, the second incident beam, and the third incident beam are not
coplanar.

14. The optical multiplexing device of claim 9, wherein the first light
receptor comprises
a receiving collimator positioned to receive the first reflected beam,
a redirecting collimator positioned to transmit the second incident beam,

5 and

an optical link from the receiving collimator to the redirecting collimator.

15. The optical multiplexing device of claim 14, wherein the optical link comprises a mirror.

16. The optical multiplexing device of claim 14, wherein the optical link comprises an optical fiber.

17. An optical multiplexing device comprising:

a light bandpass filter that passes a first light wavelength at a first angle of incidence and passes a second light wavelength at a second angle of incidence;

5 a light source that directs a first incident beam including light of the first light wavelength onto the light bandpass filter at the first angle of incidence, the light bandpass filter passing the light of the first wavelength therethrough and reflecting a first reflected beam therefrom; and

10 a first light receptor and redirector that receives one of the first transmitted beam and the first reflected beam as a first received beam, and redirects the first received beam back onto the light bandpass filter at the second angle of incidence as a second incident beam, the light bandpass filter reflecting a second reflected beam therefrom.

18. The optical multiplexing device of claim 17, wherein the first incident beam includes light of the first light wavelength, wherein the first light receptor and redirector receives the first transmitted beam, and wherein the optical multiplexing device further includes

5 a second light source that directs a second incident beam including light of the second light wavelength including the second light wavelength onto the light bandpass filter at the second angle of incidence, so that the light of the second light wavelength passes through the light bandpass filter and mixes with the second reflected beam.

19. The optical multiplexing device of claim 17, wherein the first incident beam includes light of the first wavelength and light of the second wavelength, wherein first light receptor and redirector receives the first reflected beam, and wherein the optical multiplexing device further includes

5 a first light receiver positioned to receive the light of the first light wavelength after it passes through the light bandpass filter, and

a second light receiver positioned to receive the light of the second light wavelength after it passes through the light bandpass filter.